



Applied Environmental



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December 21, 1992
Project No. 40104.50

EG&G Rocky Flats
P.O. Box 464
Golden, Colorado 80401

Attn: Mr. Randy Ogg

Re: Vadose Zone Monitoring in the Solar Ponds Operable Unit 4 (OU4) Area

Dear Randy:

The depth to water and bedrock was estimated for vadose zone boreholes in the vicinity of the Solar Ponds to determine whether adequate unsaturated thickness exists to install vadose zone monitoring equipment.

The attached table presents the estimated depths to water and to bedrock at the proposed vadose zone boring locations in the vicinity of the solar ponds. The estimated depth to water is based on interpolations from Tim Lovseth's working water table map for the Rocky Flats Alluvium. Water levels under or near the ponds may be shallower if the ponds are leaking or have leaked. The attached rough figure shows locations of vadose borings and estimated elevations for pond bottoms, water table, and bedrock in the vicinity of the solar ponds.

Bedrock elevations were estimated primarily from a working bedrock topographic map prepared by Tim Lovseth of EG&G Rocky Flats (EG&G). As shown by the range in estimated bedrock elevations for Locations 40993 and 41593, there is significant uncertainty in the bedrock elevation north of the ponds.

Alluvial water level data for two monitoring wells south of the ponds and two monitoring wells east of the ponds were obtained from the 1991 RCRA Ground Water Monitoring Report, as follows:

1991 Water Levels in Alluvial Wells in Vicinity of 207A and 207B Series Ponds

<u>Well No.</u>	<u>Location</u>	<u>High/Date</u>	<u>Low/Date</u>	<u>ΔH, ft</u>
3887	Due S. 207B-S	5964.72/7-91	5962.49/10-91	2.23
3787	E. 207B-S	5962.46/6-91	5959.55/11-91	2.91
2686	S. SE Corner 207A	5966.37/6-91	5964.98/11-91	1.39
2886	E. SE Corner 207B-N	5958.39/6-91	5955.39/1-91	3.00

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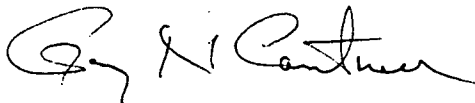
The water level contours on Lovseth's map compare reasonably well to the water levels in the four wells south and east of the ponds as tabulated above. However, for some vadose zone boring locations, the estimated water level is below the estimated top of bedrock. Since this letter summarizes only a brief exercise to determine whether there is sufficient unsaturated zone thickness for vadose zone monitoring, additional effort was not expended at this time to resolve the seeming inconsistencies where alluvial water level is indicated below the top of the bedrock.

The thinnest unsaturated zone is likely to occur in the area of Ponds 207B-Center and South. With the possible exception of this area, it appears there is sufficient thickness of unsaturated zone at the monitoring locations to install vadose zone monitoring equipment. As the other vadose zone borings are completed and more information is gained, a better estimate of the water level and bedrock elevations can be prepared.

If you have any questions or comments, give us a call.

Sincerely,

Applied Environmental Consulting, Inc.



Gary N. Cantrell, P.E.
Project Engineer

cc: J. Flook
B. Neary
T. Henderson
A. Sieben - Doty & Associates
F. Blaha - Wright Water Engineers, Inc.
C. Grose
J. Evans
C. Murray
K. Pacheco - Tierra Environmental Consulting
L. Everette - Geraghty & Miller
L. Pivonka - Geraghty & Miller

**ESTIMATED DEPTH TO WATER AND BEDROCK
VADOSE ZONE BORINGS IN SOLAR PONDS AREA
SOLAR PONDS - OU4**

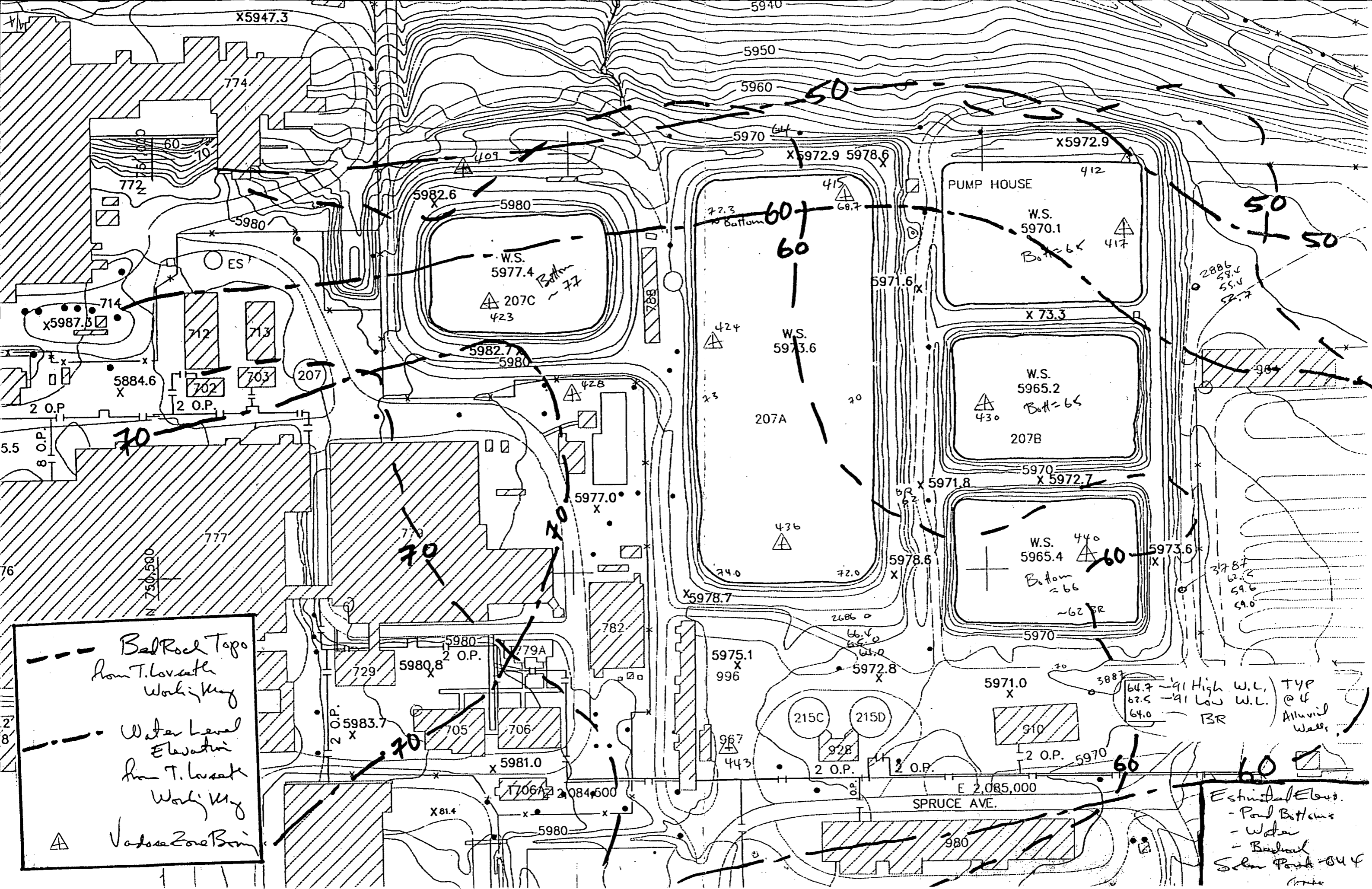
Elevations					Depth To	
	Location	Surface Elevation (ft.)	Approximate Water Level Elevation ⁴	Bedrock Elevation ²	Water (ft.)	Bedrock (ft.)
207A	41593	5969	5959	5948 ¹ - 5958	10	11 - 21
	42493	5973	5966	5963	7	10
	43693	5973	5967	5962 - 5965	6	8 - 11
	44393	5976	5964?	5967	12?	9
207B Series	41293	5972 (top of dike)	5950?	5953	22?	19
	41793	5965	5956	5954	9	11
	43093	5965	5962	5957	3	8
	44093	5966	5963 1/2	5961	2 1/2	5
	40993	5976	5952?	5958 - 5967 ³	24?	9 - 18
207C	42393	5977	5966	5966	11	11
	42893	5978	5969	5965	9	13

¹Based on W.P. Section A-A'

²Based on Lovseth's working map for bedrock topography unless otherwise noted

³Based on new cross section

⁴Based on T. Lovseth's working map for water table



--- Bad Rock Topo
from T. Lovsath
Working Map

--- Water Level
Elevation
from T. Lovsath
Working Map

△ Vadose Zone Boring

64.7 ~ 91 High W.L. TYP
62.5 ~ 91 Low W.L. @ 4
64.0 BR Alluvial
Walls

Estimated Elev.
- Pond Bottoms
- Water
- Badrock
- Solon Pond 844
Cone